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News from the Savannah River National Laboratory Media

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SRNL TO SUPPORT INTERNATIONAL ENERGY PROJECT

AIKEN, S.C. – The Department of Energy's (DOE) Savannah River National Laboratory (SRNL) announces an agreement to add its technological expertise in support of the ITER program, an international project to demonstrate the scientific and technological feasibility of a full-scale fusion power reactor.

The U.S. ITER Program Office, located at the DOE's Oak Ridge National Laboratory in Oak Ridge, Tenn., selected SRNL along with Princeton Plasma Physics Laboratory as a partner laboratory for the U.S. ITER project. U.S. ITER Project Manager Ned Sauthoff and Deputy Project Manager Carl Strawbridge met with SRNL personnel today to commemorate SRNL's participation in the program.

The U.S. ITER Program Office is one of the parties that make up the international collaboration. Currently seven national and supranational parties are participating in the ITER program: the European Union, the United States, Japan, Russia, India, China and South Korea. The project is being constructed in Cadarache, France.

SRNL's role is the design, fabrication, assembly, testing, and shipment of the exhaust processing system, working in collaboration with Los Alamos National Laboratory (LANL). In addition, SRNL is providing support at the invitation of the Commissariat à l'Energie Atomique (CEA - the French Nuclear Regulatory Agency) to join the ITER International Team in Cadarache to fill the urgent position for safety and licensing activities.

ITER, which is Latin for "the way," will play a critical role in advancing the worldwide availability of energy from fusion – the power source of the sun and the stars. It will involve the construction of a massive "machine" known as a tokamak for the production of fusion energy, followed by approximately 20 years of operation of the tokamak for research, development and experimental validation. To produce practical amounts of fusion power here on earth, heavy forms of hydrogen are joined together at high temperature, over one hundred million degrees Celsius. At these high temperatures, electrons are detached from the nuclei of the atoms, in a state of matter called plasma. In the tokamak, magnetic fields will confine the high-temperature plasma.

For decades, scientists around the world have been addressing the development of fusion energy by studying the underlying physics of plasma. ITER is the crucial step between these years of research on plasma physics and the future electricity-producing fusion power plants. Experimental operations at the project in Cadarache are planned to begin in 2016.

SRNL's development of the Tokamak Exhaust Processing (TEP) system will provide a technically mature, robust, and cost-effective solution for the separation of hydrogen isotopes from the Tokamak exhaust stream – a

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critical element in the ITER project. "SRNL's participation in this important international project builds on the laboratory's decades of work with hydrogen and its isotopes deuterium and tritium," said SRNL Laboratory Director Dr. G. Todd Wright of Washington Savannah River Company. WSRC, a subsidiary of Washington Group International, operates SRNL for the Department of Energy. "For half a century, we have been providing the applied research and development to support the Savannah River Site's production and handling of tritium for use in the nation's defense," he said. "That same expertise will help the international community take a giant step forward toward this exciting new source of clean, renewable energy."

U.S. ITER Project Manager Ned Sauthoff said, "The US ITER Project and the international ITER Organization are very pleased to have the Savannah River National Laboratory as a member of the ITER team. The ITER project draws on the best in the world in addressing a global energy challenge by an unparalleled international partnership to create 'star-stuff' on Earth, to demonstrate the scientific and technological feasibility of fusion energy. SRNL's experience and expertise in large-scale tritium processing systems and its track record of effective project execution form a unique combination that is key to the success of this unique project."

The TEP is estimated to be an eight-year project, with a cost of approximately \$60 million. Initial activities will focus on international safety and licensing, computer modeling of the process, and design support. Starting in 2010, the components of the TEP will be procured, assembled, tested and shipped to Cadarache, France, by 2014.

When the international partners signed the agreement last November to begin construction of the project, U.S. Secretary of Energy Samuel W. Bodman said, "The U.S. is proud to be part of this partnership, and to join in the pursuit of nuclear fusion as a source of clean, safe, renewable and commercially deployable energy for the future." Fusion energy is an important component of President Bush's Advanced Energy Initiative (AEI), given fusion's potential to become an attractive long-range option for the U.S. clean energy portfolio. In FY 2006, DOE allocated \$25 million to ITER and the President, as part of the AEI, has requested \$60 million for U.S. ITER support in FY 2007.

For more information on the U.S. role in ITER, see the DOE Office of Science web page at <http://www.sc.doe.gov/> or http://www.sc.doe.gov/News_Information/News_Room/2006/ITER/index.htm

SRNL is the applied research and development laboratory at DOE's Savannah River Site, putting science to work in the areas of energy security, national and homeland security, and environmental management.

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